

EXHIBIT 2-11

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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

ORACLE AMERICA, INC.,)
Plaintiff,)
vs.) No. CV 10-03561 WHA
GOOGLE, INC.,) VOLUME I
Defendant.)

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Videotaped Deposition of ROBERT VANDETTE,
taken at 42 Chauncy Street, Boston,
Massachusetts, commencing at 10:02 a.m.,
Wednesday, September 7, 2011, before
Jill Shepherd, RPR, MA-CSR No. 148608,
NH-CSR No. 128, CA-CSR No. 13275, CLR,
and Notary Public.

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<p>1 preserve the objection. I don't believe 2 this was produced to Oracle, but perhaps you 3 can confirm that after this deposition and 4 we can take it off line. 5 Q. Are you familiar -- have you seen this 6 presentation before? 7 A. (Witness reviewing document). 8 MS. AGRAWAL: Objection. Form. 9 MR. FRANCIS: I would note that 10 this presentation is cited in Oracle's claim 11 charts. 12 MS. AGRAWAL: The video? 13 MR. FRANCIS: So you should be 14 familiar with it. 15 MS. AGRAWAL: The video or the 16 actual presentations? 17 MR. FRANCIS: Both, I believe. 18 MS. AGRAWAL: All right. Let's 19 take it off line. 20 A. (Witness reviewing document). 21 I may have seen a presentation similar 22 to this. I can't confirm that this is the 23 exact content that I have seen or whether I 24 read through the entire presentation. 25 Q. Okay. Just for a second, jump to slide 11,</p> <p style="text-align: right;">Page 42</p>	<p>1 Q. All I asked if you see this third line, and 2 if you understand what it seems to be 3 saying. I'm not asking if you agree with 4 it. 5 A. I do not agree with -- 6 MS. AGRAWAL: You've got to let me 7 object. The court reporter has to be able 8 to take it down. Sorry. 9 Objection. Form. 10 A. I do see it and I do not agree with it. 11 Q. Have you run any tests to determine what 12 percentage of the time the CPU spends 13 executing byte codes as opposed to natively 14 compiled code? 15 MS. AGRAWAL: Objection. Form. 16 A. I have performance analysis in the past on 17 our own virtual machines, and it very much 18 depends on the byte codes and the program 19 that you are running whether it spends 20 little or a lot of time in the JIT -- or in 21 executing byte codes, I'm sorry. 22 Q. Maybe we can clarify just a little bit. 23 Your performance report is measuring 24 the performance of the Dalvik Virtual 25 Machine, but not Android operating system</p> <p style="text-align: right;">Page 44</p>
<p>1 there's a diagram that's labeled "Dalvik 2 Trace JIT Flow"? 3 A. Okay. 4 Q. Have you seen this before? 5 A. No, I have not. 6 Q. Now looking at slide five, the third point 7 that's listed here, it says, "Typically, 8 less than a third of time spent in the 9 interpreter." 10 Do you see that? 11 A. This is very subjective. 12 Doing what? 13 Q. Do you understand generally what it means? 14 I'm not asking if you agree, but do you 15 understand what it's saying here? 16 A. I would just like to come to your point -- 17 MS. AGRAWAL: Objection. Form. 18 A. -- with the data on this slide that shows 19 that running the checkers, that you're 20 running 93 percent of the time in JIT code 21 cache. So you are using almost 100 percent 22 of the CPU when you are running checkers, so 23 how do you conclude, then, that one-third of 24 the time you are, on average, in 25 interpreter?</p> <p style="text-align: right;">Page 43</p>	<p>1 overall -- 2 MS. AGRAWAL: Objection. Form. 3 Q. -- is that correct? 4 MS. AGRAWAL: Objection. Form. 5 A. It's difficult to answer that question 6 because the Dalvik Virtual Machine is part 7 of the Android operating system, so which 8 part are you -- 9 Q. Is it part of the prior Android operating 10 system? 11 MS. AGRAWAL: Objection. Form. 12 A. My report states that I disabled much of the 13 Android platform so the CPU was available 14 for executing these benchmarks, so... 15 Q. In a normal environment, is much of the 16 Android platform disabled? 17 MS. AGRAWAL: Objection. Form. 18 A. In the normal Android platform, there is 19 many Dalvik Virtual Machines running, which 20 could have interfered with my results. 21 Q. In a normal environment, is there anything 22 other than a Dalvik Virtual Machine running 23 on the Android operating system? 24 MS. AGRAWAL: Objection. Form. 25 A. It's running on top of the Linux kernel, but</p> <p style="text-align: right;">Page 45</p>

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<p>1 Q. I'm not asking you for a specific number. 2 Give me a general ballpark figure. 3 MS. AGRAWAL: Objection. Form. 4 A. You are asking me to describe changes or 5 incremental performance improvements in 6 groups that I really wasn't involved in. 7 Q. Turning to page eight, paragraph 28 of your 8 report, you discuss the modifications that 9 you made to conduct your experiments; is 10 that correct? 11 A. Yes. 12 Q. And you created these modifications based on 13 what you were told by Professor Mitchell and 14 Peter Kessler; is that correct? 15 MS. AGRAWAL: Objection. Form. 16 A. Yes. We discussed the functionality, and 17 Peter I both looked through the sources to 18 try to find out how to properly disable this 19 functionality, and we came to a consensus. 20 Q. It appears that you attempted two out of 21 three possible scenarios here? 22 A. That's correct. 23 MS. AGRAWAL: Sorry, objection. 24 Form. 25 Q. The first scenario in paragraph 28 is</p> <p style="text-align: right;">Page 82</p>	<p>1 A. It would impact the results potentially, 2 since I'd be adding additional functionality 3 to Dalvick that it doesn't currently have. 4 Q. It would, however, be technically possible 5 for someone to do so? 6 MS. AGRAWAL: Objection. Form. 7 A. Let's see. It may be technically possible 8 to build a system that does quickening 9 without side tables, but it would involve 10 adding additional overhead that Dalvick 11 doesn't currently have. 12 Q. In paragraph 36, you state that you did not 13 try running the trace compiler; is that 14 correct? 15 A. Oh, paragraph -- sorry. That is correct, 16 for the same reason that we didn't do the 17 quickening alone. 18 Q. What is the trace compiler? 19 MS. AGRAWAL: Objection. Form. 20 A. That is Dalvick's implementation of a JIT. 21 Q. Are you saying that for your performance 22 benchmark regarding the '104 patent you had 23 to disable the JIT? 24 MS. AGRAWAL: Form. 25 A. That's correct.</p> <p style="text-align: right;">Page 84</p>
<p>1 building side tables, but not quickening 2 instructions, and the second scenario is not 3 building side tables or quickening 4 instructions; is that correct? 5 A. That's correct. 6 Q. Is there a third possibility of not building 7 side tables, but building quickening 8 instructions? 9 MS. AGRAWAL: Objection. Form. 10 A. The quickening was dependent upon the side 11 table for its implementation in order to 12 avoid, you know, any possible error in the 13 results. We did not want to substantially 14 modify Dalvick in order to try to attempt 15 that. We wanted to restrict our changes to 16 just simple commenting out of code that 17 would provide the before and after. 18 Q. So if it got too complicated, you did not 19 attempt it? 20 MS. AGRAWAL: Objection. Form. 21 A. It's not an issue of complication. It's an 22 issue of possibly altering the Dalvick to 23 the point where I wouldn't be measuring what 24 I wanted to measure. 25 Q. It would be --</p> <p style="text-align: right;">Page 83</p>	<p>1 Q. Do you understand that the JIT is not part 2 of the accused functionality of the '104 3 patent? 4 MS. AGRAWAL: Objection. Form. 5 A. I'm not certain that it isn't somehow 6 involved in some of the claims, but we 7 focused on turning off the functionality in 8 a mode that was possible. 9 Q. If, in fact, JIT is not part of the accused 10 functionality, then wouldn't disabling it 11 affect the performance of this benchmark? 12 MS. AGRAWAL: Objection. Form. 13 A. I do believe that the numbers would be 14 slightly different; however, the overhead of 15 having to re-resolve all of the classes, 16 fields, and methods is a fixed overhead that 17 the JIT could not compensate for. So I 18 believe the performance reduction or 19 degradation would still be substantial. 20 Q. Despite fixed overhead, you are referring to 21 other aspects of the benchmarking programs 22 might execute faster if the JIT was enabled; 23 is that correct? 24 MS. AGRAWAL: Objection. Form. 25 A. They would be severely diminished by the</p> <p style="text-align: right;">Page 85</p>

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<p>1 JIT compiler?</p> <p>2 MS. AGRAWAL: Objection. Form,</p> <p>3 beyond the scope.</p> <p>4 A. I understand that HotSpot method-based JIT</p> <p>5 compiler and Android is a trace-based JIT</p> <p>6 compiler.</p> <p>7 Q. If Android was using a method-based JIT</p> <p>8 compiler, is it your belief that it would</p> <p>9 infringe the patent?</p> <p>10 MS. AGRAWAL: Objection. Form,</p> <p>11 beyond the scope.</p> <p>12 A. You'd have to show me and my team the</p> <p>13 implementation in order to determine that.</p> <p>14 Q. Does HotSpot practice -- strike that.</p> <p>15 Does the HotSpot Just-In-Time compiler</p> <p>16 practice the '205 patent?</p> <p>17 MS. AGRAWAL: Objection. Form,</p> <p>18 beyond the scope.</p> <p>19 A. It's my understanding that this patent was</p> <p>20 issued around the time of early Java, but we</p> <p>21 had alternative -- we had a -- you know, a</p> <p>22 pre-computer HotSpot compiler, so it's hard</p> <p>23 to say. My guess, I would believe it would.</p> <p>24 Q. The current HotSpot Just-In-Time compiler</p> <p>25 practices the '205 patent?</p> <p style="text-align: right;">Page 98</p>	<p>1 -Xint:fast mode and the -Xint:jit mode for</p> <p>2 the interpreter versus the JIT-enabled</p> <p>3 results.</p> <p>4 Q. Paragraph 49, you say, "These tests show the</p> <p>5 performance difference that JIT provides</p> <p>6 above and beyond interpreter only"; is that</p> <p>7 correct?</p> <p>8 A. Yes.</p> <p>9 Q. Is the accused functionality the entire JIT</p> <p>10 or only a specific portion within the JIT?</p> <p>11 MS. AGRAWAL: Objection. Form.</p> <p>12 A. As I understand it, it's the technique used</p> <p>13 to store the results of the JIT and such.</p> <p>14 If you are unable to store the results of</p> <p>15 the trace JIT, you wouldn't have a JIT;</p> <p>16 therefore, disabling the JIT is comparable</p> <p>17 to disabling the patent.</p> <p>18 Q. Are there other ways to store the results of</p> <p>19 the JIT?</p> <p>20 MS. AGRAWAL: Objection. Form,</p> <p>21 beyond the scope.</p> <p>22 A. I don't know. You are asking: Are there</p> <p>23 other ways to store the results that are not</p> <p>24 infringing? Is that what you are asking me?</p> <p>25 Q. I'm asking you: Is the only way to</p> <p style="text-align: right;">Page 100</p>
<p>1 MS. AGRAWAL: Objection. Form,</p> <p>2 beyond the scope, and calls for a legal</p> <p>3 conclusion.</p> <p>4 A. From my understanding, I believe it does.</p> <p>5 Q. Did you try comparing the performance of a</p> <p>6 current HotSpot Just-In-Time compiler with</p> <p>7 one that existed before the '205 patent?</p> <p>8 MS. AGRAWAL: Objection. Form,</p> <p>9 beyond the scope.</p> <p>10 A. From my report, I measured the current</p> <p>11 HotSpot implementation.</p> <p>12 Q. Looking at page 18 of your report, the chart</p> <p>13 here is entitled "Android CaffeineMark JIT</p> <p>14 Improvement Results."</p> <p>15 Does this reflect the difference</p> <p>16 between running Android with and without a</p> <p>17 JIT?</p> <p>18 MS. AGRAWAL: Objection. Form.</p> <p>19 I also just note for the record that</p> <p>20 we produced this to Google in color, and so</p> <p>21 this isn't the original that was -- the</p> <p>22 report wasn't what was given to Google; but</p> <p>23 you can answer the question.</p> <p>24 A. The command that I used to execute is in the</p> <p>25 report. It's on paragraph 49. I used</p> <p style="text-align: right;">Page 99</p>	<p>1 implement a JIT is by using the '205 patent?</p> <p>2 MS. AGRAWAL: Objection. Form,</p> <p>3 beyond the scope.</p> <p>4 A. I don't know.</p> <p>5 Q. If there was a way to implement a JIT</p> <p>6 without practicing the '205 patent, would it</p> <p>7 make sense to benchmark the performance</p> <p>8 between that JIT and the current Android JIT</p> <p>9 that Oracle alleges infringes the '205</p> <p>10 patent?</p> <p>11 MS. AGRAWAL: Objection. Form,</p> <p>12 beyond the scope.</p> <p>13 A. You are asking me to speculate on something</p> <p>14 which I have already stated that I don't</p> <p>15 know how you would do. So, again, the</p> <p>16 answer is, I don't know.</p> <p>17 Q. In paragraph 53, you say, "Before starting</p> <p>18 each benchmark run, the script cleans out</p> <p>19 the dalvik-cache."</p> <p>20 Do you see that?</p> <p>21 A. Yes.</p> <p>22 Q. What is in the dalvik-cache?</p> <p>23 MS. AGRAWAL: Objection. Form.</p> <p>24 A. The dalvik-cache contains an optimized</p> <p>25 version of the dex file, and if you run --</p> <p style="text-align: right;">Page 101</p>

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